CRITICAL THINKING FOR ADULTS: CAN IT BE TAUGHT

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ABSTRACT: Much research into why and how critical thinking can be taught is directed towards traditional educational contexts and students. But how can those who are already in the workforce--or who would like to be--obtain needed preparation, as adults, for gaining crucial skills in critical thinking, innovation, and problem solving? Mastery in such skills cannot be learned just by mechanical training techniques, delivered online or otherwise, and many adult-oriented materials for enhancing creativity and problem-solving seem best suited for already-prepared minds. The paper invites researchers to inquire how less well-prepared adults can also succeed in bridging this gap.

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The nature of critical thinking, and how—and why—it should be taught, are important concerns for today's curriculum developers. But, for the most part, their work is directed towards traditional educational contexts and students. This paper is a call for research in a new direction. What can this field offer to the adult learner, who is in, or seeks to join, the workforce?

This is no idle question. Society now recognizes that to adapt to increasing technological change, training of some sort is crucial. Without this training, many new job seekers will be unqualified for the skilled positions now opening. (CLMPC 1990) How this important training can be accomplished--especially "training" for thinking and mastery--has not been adequately addressed. lf conventional government responses (namely, pouring money into training programs) fail to address these latter issues, it is incumbent upon more academic investigators to venture into these practical realms.

Ironically, the hopes now pinned on conventional training parallel a sports experience in the 1940's and l950's. Americans were then trying desperately to identify the elusive "training method" that (according to the day's sports writers) was "enabling" European endurance racers to repeatedly be victorious. Fads of adopting, in turns, various European techniques all proved fruitless, while, in fact, each of the most successful marathoners of the era was using a different training method from the others. (Doherty 1964: 12f)

Mastery, it appears, depends on more than just the techniques imparted by training. Successful people are the critical and creative thinkers who can adapt technique to circumstances, and respond appropriately to the changes, the decision requirements, and the unexpected which are at the heart of life. Where talent, chance, and other imponderables play a role in the outcome, one's scope for action may be limited, but those who are successful tend to make the most of the opportunities that are available. The point of these comments will be familiar to this journal's readers: Simple "training" must be distinguished from the preparation (i.e. "education") to think, solve problems, and make critical decisions. "Training" itself prepares for tasks whose desired outcomes can be specified precisely in advance, such as training to shoot targets.1 The calls of governments and industries for increased “training" tend to be primarily for this sort of instruction.

lt is "education" that provides the facility for creative and decisive thought. What decisions will be made or what will be created by the educated person cannot be exactly predicted. Thus, a true education in politics is not a persuasion to vote for one party versus another. Instead, the educated voter is one who can call upon research and experience to make an informed and intelligent choice among the alternatives.

Rice and Dreillinger’s comments on teaching Business Ethics are instructive. Drill-based training on specific do's and don'ts is ineffective, even if the employee has the best of intentions. The trained-for rules never seem to apply when it counts most. More useful are guidelines and skills on the basis of which employees can make appropriate and reasoned decisions—reflecting both the values of the company and the demands of circumstance. (Rice and Dreillinger 1990)

Most real-world goals require both training plus decision-preparation (education) to meet them. (Goodman 1990a, 1990b) Even target shooters must adjust, in game conditions, to unexpected factors—from crowd pressures, to effects of wind and temperature. They must be able to compensate—possibly in circumstances never encountered in training or in classroom testing.

This is even more significant regarding career and industrial training in our changing technological environment. The best-prepared individuals do not just know the facts and procedures in today's texts, they can also continue learning, solve new problems, and adapt creatively to change. As Gordon and Anello write with regard to Nursing training, today's workers "must now not only master the traditional professional content, [they] must also acquire a more intricate body of knowledge and learn to make independent judgements." (Gordon and Anello 1974)

These points complement the criticisms of professional schools by Donald Schon. (Schon 1987) Whereas Schon fears that the academic and "scientific" orientations of these schools fail to prepare graduates for real-world practice, I contend that employers, trade schools, and others who focus too exclusively on the "practical" skills likewise miss the mark. As Schon recognizes, a blending of the two approaches is required: training, where goals can be narrowly defined; education, for creative, decisive response.2

This brings us to the central question for this paper: Can the sort of "education" envisioned here be delivered, in practice, to adult learners? One notes that on a related question, whether virtue can be taught in later life, the philosopher Aristotle expressed some doubts: Those who already guide their actions and desires, habitually, by principle can indeed benefit from study of Moral Science. But others, such as the young and the immature in character, remain unreachable. (Nic. Ethics 1094b)

"Good judgement", in general, is the ability to make wise decisions—both conceptually, as in critical thinking, and in action, as in practical problem solving—where information is uncertain or incomplete. Though Aristotle's focus was on cases involving moral principles, it is no trivial matter, either, to exercise judgement in non-moral contexts. The question of "teachability" for these skills must be raised.

Consider the complaints of industry that so many new hires, including college graduates, appear to lack "plain old common sense." lf equipment is slightly modified, or damaged in an unfamiliar way, seemingly qualified staff are too frequently at a loss. They cannot identify the links between the present conundrum and past, once-mastered situations, or even begin this process of discovery, or pursue it consistently. Aristotle has noted why training solutions fail: There seems to be a readiness-to-benefit prerequisite for training-in-judgement which an individual either demonstrates, or else just does not get the point.

A good illustration of this phenomenon can be found in mathematics, which is, essentially, an abstract and specialized domain for problem solving. The term "mathphobes" has gained wide currency to mean individuals who are so alienated from the techniques and mind-set of the mathematical domain that they are virtually unteachable about its various details. Teachers of mathematics in introductory courses will know the difficulty: As hard as one tries, for such students, to reformulate a problem or suggest alternative techniques, every suggestion, in tum, is taken as yet another particular to be memorized; the sense that one might discover—or even look for—a general principle to unify the cases, seems lacking.

This same phenomenon is encountered among employed adults—for example, at a firm where l consulted in problem solving. Employees now work in highly complex assembly bays in a "state-of-the-art" plant. Old, repetitive tasks have been automated, so the workers' new jobs include monitoring operations, retooling for future production, and trouble-shooting when something fails. The equipment has performed essentially as specified, yet, costly "down time" has been high.

The competence and training—as usually conceived—of the plant's technicians and trades people were not in question. All are highly skilled, and performed quite adequately under the old system—where their duties were to do specific tasks at specific locations and times. These skills are still needed. Only, now, the team itself determines what tasks should be performed, at what locations and what times. Who should explore a hypothesis, if it has implications, say, for both the team's electrician and the machinist?

With John Dewey, l believe the best way to have prepared people for this challenge would be to have involved them, years earlier, in repeated experimental and problem-solving activities throughout their school education. Without neglecting the crucial training aspects of schooling (for example, writing practice), the schools should strongly encourage students to think through problems of a divergent nature, to draw information and tools as needed from a variety of sources, and to develop the capacity and motivation, in concert with others, to secure and adapt all necessary resources. Work-study opportunities to model real-world problem solvers in action could also be helpful.

But note how these comments have used the past tense, to imply something of Aristotle's perspective. If a worker has already internalized the essence of creative decision making, through some such background as described, then the occasional "refresher" workshop on de Bono's Lateral Thinking, or the like, can prove quite useful. It bolsters people's enthusiasm, reminds them of principles they basically know, and provides them with the occasional helpful tip.

Yet, what of those who, for whatever reason, lack or have lost-this facility? They could be supervisors in a workshop on supervisory strategies, being so accustomed to the strained union/management relations at their shop that they dismiss all new ideas with “lt wouldn't work here!" Or they could be university undergraduates, resisting new training in teamwork techniques-having been trained in school to complete most assignments individually, and to guard against cheating. (Stemberg and Davidson 1987; p. 10)

How can trainers ensure that these under- or mis-prepared students are not be denied the chance for learning? Traditional training is unlikely to change the ideas or behaviors of such students.

lt is promising that the literature on teaching thinking, problem-solving, and creativity is rich and growing. If schools and colleges impart these skills, then this certainly will lay the groundwork for future successes and trainability. But are these skills being taught to the adult learners who have left the traditional systems of education? Their need for this preparation is great, but they have also had much opportunity to be mis-trained and build resistance.

Adult-oriented materials are available from commercial trainers, from de Bono and Kepner-Tregoe to others listed by the American Society for Training and Development. Yet, these seem best suited for already well-prepared minds. Who serves those who (currently) lack the preconditions for effective learning?

Regarding literacy and numeracy, the need for remediation before certain types of training can be undertaken is widely understood and accepted. We recognize, for example, that individuals cannot be trained in electronics per se until they are brought up to speed in basic addition and other mathematics fundamentals. But that remediation in problem solving and thinking may be required before an individual can benefit from courses either in a new specialty or in advanced thinking techniques has not been as widely recognized.3 l submit to the readers of this journal that this topic is critical for future research efforts—examining just when such remediation is required and how it can be delivered.

In my own combination of research and "hands on" course development for industry, l have some tentative answers to these questions. They are based on creating as much opportunity as possible for the individuals involved to engage in guided, but largely self-directed, problem-solving activities. But the demands of finishing courses on schedule, at the pace of the average-prepared students, limits the experimentation that can be conducted within actual industry courses. Researchers with the ideas and opportunities for advancing the techniques and theories of thinking remediation are desperately needed.

We have seen that meaningful work is too complex, and too subject to change, for its preparation to consist of just specific directives for performing set tasks. If "education" is preparing people for critical thinking, problem solving, and innovation, then this process is urgently needed by our workforce. All the better if the preparation begins during young people's schooling. But society cannot ignore that many who are now working or seeking employment simply lack this basic preparation, just as others lack preparation in literacy and numeracy. Their progress requires some mode of remediation to fill these gaps. Research on how to conduct this remediation is urgently needed, and those who look at similar questions within academia are called upon to lend a hand.

ENDNOTES

1. R.S. Peters defines training as occurring when "(i) there is some specifiable type of performance that has to be mastered, (ii) practice is [typically] required for the mastery of it, (iii) little emphasis is placed on the underlying rationale." (Peters 1967: 15) The purpose of training, as Walter Buckingham writes in *The lmpending Education Revolution* is “to develop certain automatic facilities." (Lusterman 1977: 8)

2. Charles Brauner distinguishes mere "occupations" from "professions"—based on the extent to which the requirements for doing the job well “extend beyond those proficiencies that can be achieved by training [alone]." For example, teaching is cited as a “profession". (Brauner 1978) l would counter, however, that human endeavour tends to fall on a continuum, between his extremes of simple occupations and professions. Just as Brauner admits that professionals also require some technical training, so too do laborers require a measure of education.

3. Someone who has clearly recognized this point is David T. Kearns, Chief Executive Officer for Xerox. To be effective, he says, our industries must hire people who are “prepared to work and who have learned how to think...We want the schools to educate [that is, to provide the prerequisites], we will train." (Galagan 1990) Obviously, if this background is lacking, some sort of remedial, in- house education must be considered.

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